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# BUREAU OF
# ENTOMOLOGY AND PLANT QUARANTINE
# NEWS LETTER

VOLUME VIII 5

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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR MARCH 1941

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## ADMINISTRATION

### Bureau Appropriations

The First Deficiency Act for the fiscal year 1941 was approved April 1. It includes two items which relate to the work carried on by the Bureau. These are (1) $2,225,000 for the control of incipient and emergency outbreaks of insect pests and plant diseases, which is $225,000 above the Budget estimate but is not the full amount recommended by the Department; and (2) $18,000 under the item Foreign Plant Quarantines, appropriated for additional expenses in connection with the operation of the Inspection House at Hoboken, N. J.

The bill to provide appropriations to the Department for the fiscal year 1942 has passed the Senate and is now being considered in conference. As passed by the Senate the bill provides $5,407,917 for the Bureau exclusive of the amount for white pine blister rust. The amount of the Senate bill is $105,985 above the Budget estimate. The increases above the Budget estimate provided in the Senate bill are:

| | |
|---|---|
| Dutch elm disease eradication (This is $50,000 less than the amount available for the current fiscal year.) | $50,000 |
| Citrus canker | 13,485 |
| Barberry eradication | 42,500 |

The Senate bill provides the full amount of the Budget estimate for the appropriation for white pine blister rust control and will increase the amount appropriated to the Bureau by $100,000.

### Study of Agricultural Chemicals Plays Part in Defense Program

Commissioner Chester C. Davis, of the Agricultural Division of The Advisory Commission to the Council of National Defense, has made arrangements with Secretary of Agriculture Claude R. Wickard under which the personnel of the Bureau of Entomology and Plant Quarantine will be available to the Agricultural Chemical Section of the National Defense Commission in an advisory and consultative capacity. As a part of this a study is being made of the changing situation with respect to chemicals used for insecticides and fungicides, including technical and statistical information on the chemicals used. R. C. Roark is devoting special attention to these matters. Among the major questions under consideration are the type, quantity, and distribution of insecticides and fungicides; location of manufacturing plants; seasonal fluctuations in business; manufacturing practices; availability of raw materials; the price situation; and the possibility of switching from one type of insecticide to another in case of shortages in seasonal materials.

## FRUIT INSECT INVESTIGATIONS

Peach mosaic vector research.--In cooperation with the United States Bureau of Plant Industry, Brownwood, Tex., and the California Citrus Experiment Station, Riverside, Calif., investigations to determine the vector or vectors of peach mosaic virus were instituted in 1938. The results of the first 3 years of test work conducted at San Bernardino, Calif., and at the sublaboratory at Brownwood, Tex., have been summarized by L. D. Christenson, L. S. Jones, D. D. Jensen, and O. H. Graham. To date, 2,703 tests, in which more than 177 different insect species were employed, have been made. The 1938 and 1939 tests provided negative results only. Due to a long incubation period of the virus in peach, the results of the 1940 tests cannot be determined until foliage is well developed on test trees in 1941. Included in the total number of tests are 33 with 3 species of Acarina, 126 with 6 species of Thysanoptera, 11 with species of Aleyrodidae, 887 with at least 30 species of Aphiidae, 788 with more than 69 species of Cicadellidae, 55 with 8 species of Fulgoridae, 32 with 4 species of Araeopidae, 1 with 1 species of Cercopidae, 17 with 4 species of Psyllidae, 87 with 6 species of Membracidae, 6 with miscellaneous Homoptera, 233 with 11 species of Miridae, 32 with 1 species of Pentatomidae, 68 with 1 species of Piesmidae, 21 with 3 species of Tingidae, 68 with 7 species of Coreidae, 23 with 1 species of Anthocoridae, 94 with 7 species of Lygaeidae, 32 with 1 species of Pyrrhocoridae, 7 with 2 species of Neididae, 3 with 2 species of Cydnidae, 58 with 7 species of Coleoptera, and 21 with 3 species of Orthoptera. Approximately 15 tests have been made for each species employed. Although numerous insects on the peach mosaic survey list are still inadequately tested, most of the outstanding suspects have been worked with extensively, the green peach aphid (Myzus persicae (Sulz.)), for instance, being the subject of 191 careful and varied tests. In conducting the tests, the general method of transfer of large test populations of the insect with brush or aspirator from inoculum to healthy peach was supplemented by a free exchange type of test in which test insects were allowed unhindered access to inoculum and healthy peach tissue confined within a cage. Another method consisting of direct transfer to healthy peach of insects found on peach mosaic infected trees in orchards or reared on diseased trees at the laboratory was used in many instances. Allowances were made for an exceptionally long incubation period of the virus in the insect. In replicate test series, different sources of insects, types of inoculum and test tree tissues for feeding, ages of inoculum and test trees, and lengths of feeding periods were used whenever consistent with the ability of the test insect to stand the conditions imposed. Tests were made at all seasons of the year and test activity was synchronized with the normal seasonal succession of insects in peach orchards as much as possible. Severe strain peach mosaic of demonstrated virulence was used as inoculum in most of the tests. A few involved the use of milder strains and field strains of unclassified virulence. Some of the mosaics in related stone fruits also served as inoculum.

Peach insect survey of western United States.--In March 1937 a mobile entomological laboratory was assigned to the work of exploring the field of peach mosaic vector possibilities as a prelude to a program of peach mosaic vector tests. L. D. Christenson, L. S. Jones, D. D. Jensen, and O. H. Graham, of the San Bernardino, Calif., laboratory and Brownwood, Tex., sublaboratory, summarized work accomplished by the survey unit thus far. More than 26,000 records of insect occurrence in peach orchard environments are now in survey files. Collections were made at more than 90 selected sampling stations in Oklahoma, Colorado, Texas, New Mexico, Arizona, Utah, California, Washington, and Oregon. The mobile survey unit traveled 54,711 miles without serious mishap during the 4-year period. Regular sampling stations in peach mosaic infected orchard districts were visited generally 3 or more times each year at different seasons, i.e., blossom stage, preharvest foliage stage, post-harvest foliage stage, and dormant stage of the trees. All orchard ecological strata were sampled, including the tree, cover, soil surface, and soil strata. In addition, associated trees, shrubs, and other stone fruits were given attention wherever they occurred within the boundaries of a sampling station. Incidental to the peach mosaic infected orchard surveys, work in relation to "X" disease of peach and chokecherry, "Muir's" disease of peach, mottle-leaf of sweet cherry, and pinkfruit of sour cherry, was carried on. The Division of Insect Identification provided approximately 11,479 identifications during the 4-year period. In addition to furnishing a basis for objective vector research on peach mosaic and the other stone-fruit viruses mentioned, survey information has added much to present knowledge of the distribution of many species, provided the United States National Museum with adequate series of many insects previously poorly represented in collections, furnished specimens of numerous species new to science, and, finally, increased materially the fund of information relative to peach insects in the desert and semiarid areas of western United States.

## MEXICAN FRUITFLY CONTROL

Status of fruitfly and citrus fruit harvesting in lower Rio Grande Valley.--Very heavy rains in January, February, and March materially delayed the harvesting of citrus fruit in the Rio Grande Valley of Texas this season. It is estimated that the harvesting period was more than 30 days delayed on this one account alone, and as there has developed a rather light infestation of the Mexican fruitfly in the area regulated under Quarantine 64, the harvesting season for grapefruit was extended from April 30 to May 31. The harvesting season for oranges had been previously extended to that date. Sterilization rooms have been installed in many of the packing houses, and as the vapor-heat treatment has proved so satisfactory, and as the process eliminates the possibility of spreading the infestation of the Mexican fruitfly through the shipment of infested fruit, the lengthening of the harvesting season no longer presents a serious insect hazard. At the close of March only 186 larval infestations had been found throughout the entire season and during the month of March only 36 fruitflies were trapped in the regulated area. At the close of March shipments of fresh fruit amounted to 24,642.8 equivalent carlots. It is estimated that at that time there remained approximately 5,000 carloads of fruit to be harvested. In all probability less than 50 percent of this amount will be shipped as fresh fruit and the remainder will be processed at the juice plants.

## CEREAL AND FORAGE INSECT INVESTIGATIONS

Comparative susceptibility to borer injury of commercial and promising varieties of sugarcane.--During the past harvesting season, J. W. Ingram and others of the Houma, La., laboratory, determined the borer infestation in replicated Bureau of Plant Industry commercial variety test fields in three locations in plant cane and in three locations in stubble cane. Infestation counts were also made in a similar number of promising noncommercial variety test fields. Of plant cane commercial varieties, C. P. 29/103 was much more heavily bored and Co. 290 significantly less bored than any other varieties. Of stubble cane commercial varieties, C. P. 28/11 and C. P. 29/116 were much more heavily bored and Co. 290 significantly less bored than any other varieties.

Of the promising noncommercial plant cane varieties, C. P. 29/137, C. P. 33/324, and C. P. 33/243 were the most heavily bored and C. P. 34/79 and C. P. 33/409 were the least bored. In stubble cane noncommercial variety test fields, C. P. 33/224 and C. P. 33/243 were the most heavily bored and C. P. 32/206 and C. P. 33/253 were the least bored.

Hawaiian mealybug parasite well established.--E. K. Bynum and L. J. Charpentier, of the Houma, La., laboratory, during a recent trip (Feb.-Mar., 1941) to the sugar section of southern Florida found the Hawaiian sugarcane mealybug parasite, *Pseudococcobius terryi*, in good numbers in practically every location where examinations were made. During the fall of 1940, *P. terryi* was found in about normal numbers in Louisiana and in Georgia, which showed that the parasite survived the unusually cold winter of 1939-40. This parasite was introduced from Hawaii in 1932.

Sugarcane treated with cold water and hot water to destroy borers and mealybugs.--J. W. Ingram, E. K. Bynum, and others at the Houma, La., laboratory, conducted preliminary experiments during the fall of 1940 to determine the effectiveness of cold water and hot water in killing borers and mealybugs in and on sugarcane stalks. All borers and mealybugs were killed by soaking cane in water of ordinary temperature for 2 or 3 weeks. All mealybugs were killed by soaking for 1 week, but some borers survived this treatment.

Neither borers nor mealybugs survived treatment in water held at 52° C. (125.5° F.) for 20 minutes or 48° C. (118.5° F.) for 1 hour.

## JAPANESE BEETLE CONTROL

Defense activities affect producers of quarantined materials.--Difficulties are being experienced in obtaining sufficient labor at classified establishments to carry on their spring digging and shipping activities. Men still employed at the nurseries are reported as already demanding a wage increase, with the managements contending that their businesses do not warrant such increase. Three nurseries in Maryland report that they have had difficulty in purchasing methyl bromide for use in their fumigation chambers, because of the extensive defense program.

New high in certification activities in Baltimore area.--Shipments of certified hydrangeas and dormant and rooted cuttings from the Baltimore area during March reached a new high for the past 10 years. At one establishment, 16,559 hydrangeas and 1,148 miscellaneous plants were fumigated with methyl bromide. Due to considerable snow and freezing weather during the early part of March, digging and shipping of nursery stock was far behind schedule. In the latter part of the month, ideal weather conditions prevailed and the establishments operated to capacity. Orders on hand are reported as the best in years. In the Glenn Dale section of Maryland work for the most part consisted of the inspection of material from the Government nurseries, from which small seedlings were shipped to all parts of the country for reforestation, experimental work, and soil conservation practices. A half million seedlings and transplants were shipped by the Soil Conservation Service Nursery alone. The Maryland State Forest Nursery also made numerous shipments of large quantities of trees to points outside the regulated area in Maryland. The Plant Introduction Garden of the Bureau of Plant Industry at Glenn Dale sent out thousands of certified chestnut trees to all parts of the country.

Rosy prospects in New Jersey.--New Jersey rose growers report orders exceeding their supply. Two establishments from which large quantities of roses are certified produced a total of 340,000 roses. By the end of March two-thirds of these had been shipped or were on order. Reports were that the remainder would move with little difficulty. Azaleas moved rapidly. The majority of the growers sold out well before Easter. The nursery shipping season in the State was delayed this year, as happened in 1940. Frost in the ground prevented digging. The nurseries, however, were able to ship perennials and small shrubs, trees, and roses. Treatment of stock with paradichlorobenzene and methyl bromide increased considerably over last year. Growers report a material saving in time through the use of fumigation, since much of the laborious and expensive operation of freeing roots from soil is eliminated. Methyl bromide as a general greenhouse fumigant is also being used satisfactorily by some growers.

Machine packing of inspected perennials.--A machine for packing small perennials, intended for the chain-store trade, was installed by a grower in the New York City area. An estimated 100,000 plants will be shipped from this establishment in the near future. A large portion of these will require inspection and certification. There was a slight increase in inspection and certification work in the New York City area during March.

Reports from inspectors working out of this office indicate that nurseries have orders on hand for large quantities of nursery stock to be moved as soon as digging conditions permit. In the Long Island area, growers anticipate the movement of some 20 carloads of material to points outside the Japanese beetle regulated area. An unclassified nurseryman on Long Island advised an inspector that he had found an adult Japanese beetle in his greenhouse on February 25.

Acceptance of methyl bromide fumigation varies.--A report from the district inspector at Middletown, Conn., indicates that the proprietor of a large nursery in that section does not plan to use his methyl bromide fumigation chamber this season since he is dissatisfied with the results thus far obtained. This news has been passed along to other nurserymen in the vicinity and it is doubtful whether the other growers will utilize this chamber as they have previously done. On the other hand, 120,895 plants were fumigated with methyl bromide during March thoughout the entire area. A nursery at Mentor, Ohio, has started construction of a chamber. Two nurseries in the Baltimore, Md., area plan to construct chambers after Easter, and a nursery at Bound Brook, N. J., will enlarge its chamber after the Easter rush. A nursery at Pittsville, Md., has just placed in operation a new 400-cubic foot chamber. A fumigation chamber at a large central New Jersey establishment was in almost continuous use during the last week in March.

Growers' comments on methyl bromide fumigation compiled and published.--A list of plants that have been fumigated with methyl bromide by growers in the Japanese beetle regulated area has been compiled from records furnished by the growers. The list includes 2,024 plant species. One or more reports were received covering injury to 195 varieties, or 9.6 percent of the total. This list is now available to interested growers and to investigators working with this fumigant.

Beetle warning issued to Marylanders.--George S. Langford, of the Maryland State Horticultural Department, has issued a statement advising Maryland residents, especially those in the heavily infested sections, that 1941 will be a banner year for the Japanese beetle. For those in the cities, who intend to have gardens, he advises using plants that are immune or are least susceptible to attack by the beetle.

Portable fumigation chambers demonstrated at Virginia nursery.--Representatives of the treating section of the Division visited a large nursery in the Norfolk, Va., area twice during March with their portable methyl bromide fumigation chambers for the purpose of carrying on experimental treatments on various kinds of plants and nursery stock. On one of these visits 3,000 small azaleas were fumigated for certification.

Hundreds of gypsy moth egg clusters removed from inspected materials.--Two carloads of lumber inspected by gypsy moth inspectors during the month yielded 114 egg clusters each during the course of piece-by-piece inspection. The first of these was inspected at Concord, N. H., for shipment to Camden, N. J., and the second was loaded at Derry, N. H., for movement to Caraquet, New Brunswick, Canada. Infestations totaling 515 egg masses were found in 42 shipments of forest products inspected during the month prior to movement to nonregulated territory in Connecticut, New Jersey, New York, Vermont, and Canada. During the latter part of the month shipments of lumber were somewhat curtailed because thawing of the roads made many of the lumber yards inaccessible to trucks. State laws limiting the load limits during the thawing season also restricted the transportation of lumber.

Additional inspectors employed.--Two temporary inspectors were employed on lumber inspection in the Concord, N. H., district during the month. On March 1 it was necessary to employ another temporary inspector on nursery inspection work at Newport, R. I. Two extra inspectors were employed for nursery and greenhouse inspection work in Delaware. They were first assigned to one of the larger classified nurseries in the State to gain experience. Personnel working in the Salisbury, Md., area was increased by the addition of six inspectors during March.

Beetle-infested material collected for culturing.--During the past 6 weeks, 30 men have been collecting elm material infested with Hylurgopinus rufipes Eich. and Scolytus multistriatus Marsh. for the Bloomfield culture laboratory. In the laboratory the material is caged in individual cans and held at temperatures favorable for beetle emergence. These beetles are then cultured for the presence of the Dutch elm disease fungus. The scouting was all done outside of the known diseased area. Routes and sections where elms are known to be common or bark beetles prevalent were selected for special attention. In order to make the survey more representative, there were also included routes where the above conditions were less common, but where there was considerable travel from the major area. It is estimated that 4,000 miles of roadways, railroads, and streams were surveyed. The area can be roughly bounded by a line drawn from Boston to Pittsfield, to Glens Falls, to Schenectady, to Syracuse, to Ithaca, to Harrisburg, and to Baltimore. Excluding the major work area, this area comprises about 40,000 square miles. Thus the coverage of only 10 linear miles in a 100-square mile area shows how superficial the survey really was. Furthermore only about 800 man-days were devoted to the scouting at a rate of 50 square miles per man-day. Only 400 sets of specimens were collected at the rate of 1 specimen per 100 square miles or 1 specimen per 2 man-days. S. multistriatus was reported as found in most of the area except between Springfield and Boston and in the section north and east of Binghamton. The results of the laboratory cultures will not be known for several weeks. The culturing of this material must await completion of culturing of similar material collected from detached areas earlier in the winter.

Elm material collected for spraying experiments.--Experiments are being carried on in cooperation with the Morristown, N. J., research laboratory of the Division of Forest Insect Investigations in spraying elm logs and wood piles with an orthodichlorobenzene-fuel oil mixture for the purpose of testing under actual field conditions the recommendations of the research laboratory for the killing of bark beetles in elm bark and for repelling insects from the wood so sprayed. It is planned to test out these sprays at certain centralized locations in New Jersey and New York, and also possibly on a few large properties. In Connecticut, it is planned to carry on the experiments at such locations as the State clears for the work. From regular cutting operations, crews are hauling in "run of the mill" elm material instead of burning it on location. The wood piles are being accumulated at a number of the county office yards, at burning pits, and selected field locations where the material will be reasonably safe from theft and other dangers minimized. Members of the laboratory staff are demonstrating to district supervisors the correct procedure in applying the spray material to logs and wood piles. The entire project may involve the spraying of approximately 10,000 pieces at the centralization points. About 1,500 gallons of spray have been made up and distributed to the field. Regular knapsack fire fighter sprayers are used to apply the spray. Federal and State research men will check on the work and collect what data are to be had. It is anticipated that the work will be completed by May 15 next.

Daily broadcast of fire-hazard conditions in Connecticut.--The Connecticut State Forest Fire Warden has inaugurated a daily radio broadcast emanating from his office at 7:30 a. m. to indicate whether the day is considered a high, medium, or low fire-hazard day. Burning of elm material removed by eradication or sanitation workers is permitted with certain restrictions on the low-hazard days. Unlimited burning is permitted only on rainy days. The Connecticut Dutch Elm Disease State Leader has advised all district supervisors that arrangements must be made to secure the fire-hazard report each morning, and govern the burning of elm material accordingly. In every case, all of the wood that can be hauled must be burned at dumps where unlimited burning is permitted by the fire warden of that district.

Woodpecker work in Montgomery County, Pa.--Evidence of recent woodpecker work has been reported from various sections of Montgomery County. This has apparently occurred during the past 3 or 4 weeks. As a result, a considerable amount of infested material is now being discovered that was missed during the regular scouting for beetle material in December and January. All sections involved will be rescouted in April. This situation affords additional evidence that the months of March and April are favorable for an effective beetle material survey.

Pennsylvania lumbermen cooperate.--A number of lumbermen engaged in the cutting of shoring and blocking material for a large steel corporation in Pennsylvania have been contacted and have expressed their willingness to cooperate with the Dutch elm disease eradication project by discontinuing the cutting of elms. They have agreed to permit periodic inspections of their operations at any time.

Scolytus multistriatus found in Orange County, N. Y.--Scattered evidence of S. multistriatus has been observed in the Neversink Valley at a point northeast of Port Jervis. Beetles are very scarce in this vicinity and apparently have attacked only choice material, such as hangers resulting from storm damage.

## FOREST INSECT INVESTIGATIONS

Effectiveness of overwintering adult Hylurgopinus rufipes Eich. as transmitters of Ceratostomella ulmi to normal elms.--R. T. Webber, Morristown, N. J., has presented additional data on the effectiveness of H. rufipes in the transmission of the Dutch elm disease fungus to normal elms. In an experiment started in 1939, 11 normal elms were infested with overwintering adults of H. rufipes artificially contaminated with C. ulmi. Six of the trees became infected. Of these only 1 developed external symptoms and vascular discoloration throughout; in 5 the infection was localized. The absence of infection in 5 trees and the localized infection in the other 5 is believed due to the fact that most of the xylem contacts were made early in the season prior to the formation of the new vascular system. According to information obtained from the Division of Forest Pathology, such contacts are likely to prove ineffective.

Field studies on distribution of crotch injuries in elm made by Scolytus multistriatus Marsh.--In the late summer of 1941, D. O. Wolfenbarger and the late T. H. Jones, of the Morristown, N. J., laboratory, conducted experiments to determine the relative abundance of elm twig crotch injuries in the vicinity of (1) logs where Scolytus multistriatus were emerging, and (2) where trap trees attracted them for breeding. Brief summaries of the results are given in tables 1 and 2.

Table 1.--Injuries near emergence locations

| Distance from emergence logs, feet | Liberty Corners | | Bedminster | |
|---|---|---|---|---|
| | Crotches | | Crotches | |
| | Examined | Injured | Examined | Injured |
| | Number | Percent | Number | Percent |
| 0-50 | 6,595 | 17.0 | 4,162 | 16.6 |
| 50.1-100 | 6,374 | 1.2 | 4,536 | 1.8 |
| 100.1-150 | 9,348 | .3 | Not counted | |
| Total number beetles emerged at each point | 3,185 | -- | 10,024 | -- |

Table 2.--Injuries near trap trees

| Results at points | Total No. of galleries in trap trees* | Distance from trap trees, feet | | | |
|---|---|---|---|---|---|
| | | 0-50 | | 50.1-100 | |
| | | Crotches | | Crotches | |
| | | Examined | Injured | Examined | Injured |
| | | Number | Percent | Number | Percent |
| A | 978 | 13,263 | .3 | 12,791 | .02 |
| B | 343 | 7,911 | .3 | Not counted | |
| C | 409 | 6,734 | .02 | Not counted | |
| D | 723 | 5,576 | .02 | Not counted | |

*These figures also denote approximately the number of female beetles attracted to the points, but there is no known method of determining the number of male beetles.

The points A, B, C, and D were placed at 278 feet E., 310 feet W., 640 feet S.E., and 744 feet N.W., respectively, of the Bedminster dispersion point given in table 1. These observations showed that (1) there were many injuries near beetle dispersion points, and (2) few injuries near points of convergence (trap tree location points) in comparison with trees farther away. The numbers of beetles dispersing from points of origin and those converging to points of attraction varied, but no conclusions were drawn from the few points under observation. Statistical computations showed that there are likely to be as many injuries in one direction of the compass as in any other.

*Analysis of square-foot duff samples taken at European spruce sawfly (Gilpinia polytoma Htg.) study plots during 1939 and 1940.*--P. B. Dowden, of the New Haven, Conn., laboratory, reports as follows on an analysis of cocoons in duff samples from permanent spruce sawfly plots: "During the last two seasons square-foot duff samples have been taken at nine study plots throughout New England in order to determine the number of hibernating European spruce sawfly cocoons present and thus make some estimate of the sawfly population within each plot. The following table presents the results of an analysis of these square-foot samples:

| Locality | Time of sampling | Samples taken | Total cocoons recovered | Cocoon classification | | |
|---|---|---|---|---|---|---|
| | | | | Living | Emerged | Killed by predators, disease, etc. |
| | | Number | Number | Number | Number | Number |
| T 12 R 16 | Spring 1939 | 100 | 1,206 | 87 | 279 | 840 |
| Maine | Spring 1940 | 100 | 1,030 | 88 | 248 | 694 |
| T 11 R 15 | Spring 1939 | 50 | 97 | 6 | 46 | 45 |
| Maine | Fall 1940 | 50 | 102 | 7 | 37 | 58 |
| Tshp. 30 | Spring 1939 | 100 | 667 | 62 | 363 | 242 |
| Maine | Spring 1940 | 100 | 880 | 197 | 378 | 305 |
| Dublin, | Spring 1939 | 100 | 12,125 | 8,471 | 871 | 2,783 |
| N. H. | Spring 1940 | 100 | 14,231 | 410 | 8,148 | 5,673 |
| Marlboro, | Spring 1939 | 100 | 14,027 | 197 | 10,312 | 3,518 |
| Vt. | Spring 1940 | 100 | 18,650 | 22 | 13,089 | 5,539 |
| Woodford, | Spring 1939 | 50 | 183 | 1 | 123 | 59 |
| Vt. | Fall 1940 | 50 | 185 | 2 | 118 | 65 |
| *Pharsalia, | Spring 1939 | 50 | 119 | 16 | 73 | 30 |
| N. Y. | Fall 1940 | 50 | 155 | 17 | 100 | 38 |
| *Westfield, | Spring 1939 | 50 | 135 | 16 | 54 | 65 |
| Mass. | Fall 1940 | 50 | 315 | 46 | 114 | 155 |
| *Orange, | Spring 1939 | 50 | 307 | 0 | 199 | 108 |
| Conn. | Fall 1940 | 50 | 396 | 3 | 267 | 126 |

*Plantations.

At most of the plots there has been a very light infestation during the two seasons in which these observations were made. The Dublin, N. H., plot is a notable exception, for it was severely infested in 1939. The Marlboro, Vt., plot was severely defoliated in 1938, one year before duff samples were taken. The spring samples were collected before the living, hibernating cocoons produced adults. The count of living cocoons was, therefore, an indication of the severity of the infestation anticipated for that year. The count of emerged cocoons is of interest when counts are made over successive years, for emerged cocoons will remain in good condition in the duff for several years after adult sawflies have issued. Yearly counts thus give a rather clear picture of the history of an infestation.

Relation of mild winter temperatures to plant and insect development.--H. J. Rust, of the Forest Insect Laboratory at Coeur d'Alene, Idaho, reports that following the mild winter of 1940-41 in the Inland Empire region, plant and insect life is far in advance of normal seasonal development. Records of plant and insect development have been maintained at this laboratory during the past 10 years. During this period the earliest plant development recorded was in 1934; however, on March 3, 1941, a number of plants were from 10 to 15 days ahead of that season. Bark beetle development shows the same advanced condition, with new attacks of *Ips oregoni* being recorded on March 21. It is expected that during the spring season cooler temperatures will produce conditions comparable to the 1934 season.

## GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

March storms cause comparatively little lost time on gypsy moth work.--Conditions were generally satisfactory for gypsy moth work during the first week in March. Severe storms on March 8 and 11 resulted in an accumulation of new snow ranging from 1 to 2 feet in depth throughout the western New England, eastern New York, and northeastern Pennsylvania areas where gypsy moth work is conducted. The workers were obliged to resort again to the use of snowshoes and working conditions in dense woodlands were so unsatisfactory, due to a thick coating of wet snow adhering to the tree growth, that scouting work was temporarily transferred to more open country. However, the snow settled quickly, and many workers were able to discontinue using snowshoes by the end of the week. Large accumulations of brush and other waste wood resulting from selective thinning work at infested locations were burned during this period. Winds of gale force blew steadily during the first 3 days of the week ending March 22, and the penetrating cold forced the discontinuance of work by several gypsy moth crews. Drifting snow hampered travel on rural roads in many localities, and the use of snowshoes again became necessary in some sections.

Gypsy moth work curtailed in Vermont.--The accomplishments of the greatly reduced force of workers remaining was relatively small during March. General scouting was necessarily suspended, and attention was concentrated almost entirely on the examination of wood lots where white birch was being cut by local operators, or where cutting operations were about to begin. These wood lots are widely scattered over the area, and many are located at a considerable distance from traveled highways. Practically all of the birch logs cut are transported by truck to a woodworking mill in Berlin, Rensselaer County, N. Y., where they are manufactured into bobbins, dowels, handles, and various sorts of wood novelties. In addition to the work in birch lots, the workers also examined a large amount of pulpwood cut in Rutland County for shipment to Corinth, Saratoga County, N. Y.; and small lots of hardwood logs from several localities in Rutland County were also examined before they were transported to a woodworking mill in Granville, Washington County, N. Y. In both cases the logs already cut were carefully examined, and the wood lots where cutting operations were still in progress were scouted. Information was also secured relative to the origin and proposed movement of saw logs and cordwood in the barrier-zone area, which will be valuable in preventing the spread of gypsy moth infestation. Considerable preliminary information was obtained by the supervisory personnel engaged in reexamining infested woodlands concerning the ownership, property boundaries, and other details, preparatory to securing written permits for the spraying of gypsy moth infested areas. A large proportion of the infested properties are combinations of woodland and pasture, and they are frequently poorly fenced. In such cases an agreement is reached with the property owners so that the temporary fences erected to exclude livestock from the areas that are to be sprayed may be satisfactorily located.

Gypsy moth work in Massachusetts progresses satisfactorily.--Although a moderate curtailment of the gypsy moth force in Massachusetts became necessary early in March, all field work progressed satisfactorily during the month. The volume of the work accomplished was, of course, less than the amount planned for the full force of employees. Fifteen crews of intermediate W. P. A. workers were detailed to scouting work; 6 crews of laborers to thinning work at infested locations; and 1 crew of laborers continued the ground work in an infested area, creosoting egg clusters above the snow line and burning brush and other trash wood. Many of the scouts were detailed to examine birch lots. It was also necessary to scout a number of other lots where considerable volumes of white pine, hemlock, maple, and other species of trees were being cut. While much of this wood was consumed locally, there was sufficient movement of the products to warrant a close examination of the logs or wood lots. Many of the scattered egg clusters found in the Massachusetts area were broken by various agencies. Ice falling from encrusted tree trunks and branches carries eggs and parts of egg clusters to the ground, birds picking at the clusters dislodge eggs, and the whipping about of branches in high winds often breaks the clusters and scatters the eggs. As the individual eggs and parts of egg clusters cannot be found when mixed with the dead leaves and debris on the forest floor, spraying with lead arsenate is necessary if the insect is to be eliminated from areas where broken egg clusters are present.

Several small gypsy moth infestations found in Connecticut.--No reduction of the W. P. A. gypsy moth force in Connecticut is likely to be necessary, as the number of workers carried on the pay-roll during the present fiscal year has averaged less than 60 percent of the quota set up for that State, and ample funds are available for the continuation of the work through next June. During the 8-month period extending from July 1, 1940 to March 1, 1941, the W. P. A. gypsy moth personnel dropped steadily in numbers despite all efforts to obtain replacements. The force diminished from a peak of 120 workers at the start of the fiscal year to a total of only 70 employees on March 15. It is doubtful if the force can be maintained even at this low level, with the continuous expansion of manufacturing industries providing increased opportunities for private employment and the prospective increase in all types of construction work with the approach of mild weather requiring additional labor. Six crews were engaged in gypsy moth scouting work in the townships of Cornwall, Litchfield, Salisbury, and Warren, in Litchfield County during March. Several additional infestations were located in the barrier-zone area of Connecticut, but the colonies were generally small, with the egg clusters scattered singly through the woodland. A small force of experienced workers scouted heavily wooded areas on high elevations, where work of this type had not been conducted for 3 or more years. Although a large percentage of the growth consisted of several varieties of oaks and other plants favored as food by the gypsy moth, only a small number of egg clusters were found and creosoted. An effort will be made to complete the scouting of all the large woodland blocks in which crews are now working before the first of May, so that the extent of infestations warranting spraying work can be definitely established and final arrangements completed before the beginning of the spraying season, which usually starts about June 1. In preparation for spraying and banding work during the approaching larval season, 3 ground crews and 2 thinning crews continued intensive treatment work at important infestations in Litchfield and New Haven Counties. Work at many of the infestations located early in the winter has been completed, and the stands of tree growth are in excellent condition for spraying.

Quarantine inspection work not curtailed in Pennsylvania.--Although gypsy moth scouting work was continued on a greatly reduced scale by the small number of workers available in Pennsylvania after the temporary reduction in personnel late in February, the quarantine inspection work suffered no curtailment during March. As gypsy moth work in Pennsylvania is directed toward the extermination of the insect, it is of vital importance that the spread to uninfested territory, or to areas where persistent exterminative treatment has eliminated the pest, be prevented. The continuous movement, both within the quarantined area and from points within the quarantined area to other destinations, of mine timbers, rough lumber, scrap metal, surface stone, and other materials that are liable to carry infestation necessitates the maintenance of an adequate inspection service at all times. Scouting work was conducted in the township of Plains, Luzerne County; Kidder, in Carbon County; and Clifton and Madison, in Lackawanna County during March. A gypsy moth infestation covering a considerable acreage on the upper slopes of a heavily wooded ridge was found in Madison. Intensive work is in progress at this infestation, and it will be continued for the remainder of the fiscal year if it is necessary in order to accomplish the extermination of the colony. Due to the reduction in field activity, many regular employees ordinarily detailed to the general supervision of W. P. A. crews were available for special assignments during March. Several of these employees were assigned to secure permits for spraying work in residential areas. This necessary work must be started well in advance of the beginning of actual spraying work because of the time required to obtain the large number of permits that must be secured in order to spray a comparatively small area.

C. C. C. gypsy moth work drastically reduced.--A severe reduction in the number of 6-hour man-days used by the C. C. C. on gypsy moth work east of the barrier zone under the supervision of this Bureau, from a high of 1,562 man-days to only 884 man-days during the last week of the period, occurred during March, and drastic further reductions are in prospect. The current losses of time were caused by the necessity of training new enrollees in gypsy moth work, including the use of sharp-edged tools; training the men in fire-fighting technique; and the impossibility of filling and maintaining the camp quotas, even though the quotas have been gradually reduced from 207 to about 140 men per camp. Many men who would normally be available for C. C. C. work have entered the Army or Navy, and many others have been absorbed by the National Defense Program. Notice has been received that approximately 15 camps in this Corps Area are soon to be discontinued, among them being several where crews have been available for gypsy moth work. About 75 percent of the enrollees in one of the Vermont camps which is to be abandoned have been engaged in gypsy moth work; and the entire personnel of a similar camp in Massachusetts has been detailed to gypsy moth work continuously, with the exception of a 16-month period following the hurricane of September 1938. While approximately 6,000 6-hour man-days were used on C. C. C. gypsy moth work during February, the abandonment of the camps will result in a reduction of about 70 percent, leaving approximately 400 man-days per week available for gypsy moth work. It will also be necessary to reduce the overhead and supervisory personnel, and a considerable number of trained men with long experience in gypsy moth work will be lost. During the latter part of March, crews in the areas affected by the prospective abandonment have concentrated on finishing work already in progress. This included the burning of accumulations of brush from thinning operations and creosoting as many egg clusters as possible at infestations near camping and lunching areas, and at another site used by a trucking concern, in order to reduce the infestations in localities from which the insects are most likely to be carried on vehicles. At the end of March gypsy moth foremen and crews were still working from 3 camps in the northern part of Connecticut, 2 camps in Massachusetts, and 1 in Vermont.

Sprayers loaned for C. C. C. gypsy moth work.--Arrangements have been made for the loan of three high-powered spraying units by the Bureau of Entomology and Plant Quarantine to the C. C. C. for gypsy moth spraying work during the approaching larval season. One of the sprayers will be used in Massachusetts and two in Connecticut. The State Gypsy Moth Organization in Connecticut will loan another sprayer for use in that State, and will assist in supervising the work. The C. C. C. will supply the lead arsenate, fish oil, and labor. All of this equipment cannot be used to fullest capacity, as sufficient labor to operate the sprayers on a double-shift basis will not be available at several of the camps.

## PLANT DISEASE CONTROL

C. C. C. workers used on winter canker removal project.--A winter project for C. C. C. workers located near a heavily infected stand of reproduction in the Scott Creek drainage on the Coeur d'Alene National Forest is canker and infected tree elimination. This work, outlined by the Forest Service, is the first step in an attempt to salvage an excellent white pine area from which about 60,000 board feet of white pine per acre was removed nearly 25 years ago. Excellent reproduction from 5 to 20 feet in height now covers most of the area but infection, started about 1927, has made deep inroads. The present work is being completed in three steps. First axemen, working in strips, remove all trees with trunk cankers. Following this a pruning saw crew eliminates all branches up to breast height. The final step is the removal of all other cankered branches by a crew equipped with long-handled saws. The first Ribes eradication will be done early this spring following the pruning work. A second pruning job will be necessary in about 2 years, at which time any latent infection, now invisible, and any old cankers that were missed will be eliminated. It is expected that as a result of pruning and Ribes eradication some of the present crop will be saved and the treeless openings will be filled by a new crop.

Over 10,000,000 Ribes eradicated in Northeastern States during 1940.--During 1940, a total of 701,838 acres was cleared of 10,971,271 wild Ribes and 12,348 cultivated bushes in the Northeastern States. This work gave protection to 253,082 acres of pine from blister rust and provided 139,239 man-days of employment. About 80 percent of the total acreage was worked by W. P. A. and C. C. C. labor. Local cooperators expended over $31,000 on Ribes eradication.

Early aecial production in the Inland Empire.--In the course of infected tree pruning and slashing in the Scott Creek drainage on the Coeur d'Alene National Forest, the first protruding aecial sacs were observed on March 16. On the following day more advanced protrusions with ruptured membranes and freed aeciospores were noted. This is not unexpected since a mild winter with unusually warm weather since early in February has stimulated all plant life to early activity. This condition plus the accompanying situation of abundant moisture throughout the region suggest the probability of heavy Ribes infection this year.

Safety prevention conference.--On March 27th a joint conference was held by the Forest Service and the Blister Rust Control Office at Spokane, Wash., to consider accident prevention. Constructive steps have been outlined under which it is hoped that the number and frequency of accidents in blister rust control camps can be reduced.

Blister rust damage to large, second-growth white pine.--A detailed study of a series of quarter-acre pine plots, comprising 14.5 acres of the old Cross Clearing Camp Site at Harrietstown, N. Y., in the vicinity of Tupper Lake, has yielded some interesting information concerning blister rust damage to merchantable-size pine growing in mixture (46 percent white pine, 37 percent other conifers, and 17 percent hardwoods). The principal source of blister rust infection was apparently skunk currants. The 1,037 white pines examined averaged 14.6 inches d. b. h. and 72 feet in height. In 1940 the percentage of infection was 61, that is, 629 pines had blister rust or had been killed by the disease. Less than 2 percent of the total trees had branch cankers only. A total of 161 pines had died from the rust, 339 had live stem cankers, and 112 had dead tops due to girdling by the disease. Of the total volume of the stand (305,757 bd. ft.), 175,311 bd. ft., or more than 57 percent of the 1940 volume, is a potential loss within the next decade, exclusive of growth loss due to infection. It is fortunate that further infection has been reduced to a minimum by removal of the beds of skunk currants.

Blister rust display.--C. C. Perry, in charge of blister rust control work in Massachusetts, reports that a blister rust display was arranged by District Leader R. E. Wheeler in connection with the annual Recreation Conference held at the Massachusetts State College at Amherst on March 14. A lively interest was evidenced by those viewing the display. Special interest was noted on the part of students who, by coincidence, had just been studying the blister rust fungus in their biology course. On the following day Mr. Perry attended the Forestry Section of the conference. One of the attending foresters, in speaking on the topic "Forest Prospects in Massachusetts," predicted that in spite of the hurricane, white pine will continue to be the one species upon which the future of forestry in New England will depend. He based his predictions on the demonstrated ability of white pine to succeed itself. History records four hurricanes in New England, each of which destroyed many mature pines, but the species has always reestablished itself with increased vigor.

Nursery inspection work in 1940.--In 1940, 63 nurseries applied for permits to ship barberry bushes into States protected by Quarantine No. 38. During the course of the inspection, which was made to determine whether or not these nurseries were eligible for permits, 608 barberry bushes were destroyed. According to L. M. Ames, this figure may be compared with 13,214 bushes destroyed in 1939 and 23,750 in 1938, indicating that nurseries interested in interstate shipment of barberry bushes are gradually eliminating other than rust-immune species. A survey of nursery catalogs on file in the Department of Agriculture Library indicates that there are fewer than 100 nurseries in the United States that in 1939-40 were advertising for sale species of barberry susceptible to attack by the stem rust fungus. The demand for such species is gradually diminishing and it is expected that they will soon be eliminated from interstate trade.

Control work progresses rapidly in western Minnesota counties.--In briefly summarizing progress that was made in barberry eradication in Minnesota in 1940, L. W. Melander states that 1,741 barberry bushes were found and destroyed during the year as a result of initial survey in Scott, Le Seuer, McLeod, Meeker, Kandiyohi, Swift, Chippewa, Big Stone, and Pope Counties. Of these, 969 (of which 187 were fruiting bushes) were located on new properties. Of 792 bushes found on 123 properties previously reported, only 100 were fruiting. Much of the work done in Minnesota in 1940 was in western prairie counties. Some resurvey, or subsequent survey, was conducted in Olmsted, Fillmore, Goodhue, and Winona Counties.

Farm operators and local governments support barberry eradication.-- Aid furnished by local agencies contributed in an important way toward the success of the field program in several States during the past year. Trucking and storage facilities valued at $4,653 were furnished by Olmsted, Winona, Dakota, Meeker, Kandiyohi, Swift, Pope, and Chippewa Counties in Minnesota. Property owners in Pennsylvania contributed labor, hauling, and storage, valued at $8,429, and county aid in Iowa exeeded $5,000 for the year.

Extensive program approved for Pennsylvania for next 12 months.-- Two State W. P. A. projects in barberry eradication have been approved recently for operation in Pennsylvania. These will provide for the employment of approximately 300 men for a period of 12 months. Henry P. Antoine, barberry eradication supervisor in Pennsylvania, contacted more than 100 farm operators in the Columbia Cross Roads and Wetona areas of Bradford County, where an extensive infestation of barberry bushes was brought under control in 1937 and 1938. The object was to obtain the cooperation of property owners in making a resurvey of this area. Mr. Antoine found in talking with farmers that yields and quality of grain in this area had been greatly improved since bushes were brought under control and that, generally speaking, property owners were anxious to cooperate in any way to prevent reinfestation.

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Influence of date of planting cotton on pink bollworm population.--A test to secure information on the influence of the date of planting cotton on the pink bollworm population was continued in 1940 at the Presidio, Tex., laboratory by A. J. Chapman, O. T. Robertson, and W. L. Lowry. A large screen-covered cage, divided into three sections of about one-fourth acre each, was used to prevent interference from outside infestations. Cotton was planted in the different sections on March 28, April 20, and May 15, respectively, representing early, medium, and late planting dates. When the test was commenced in 1939 the pink bollworm infestation was started by plowing under infested cotton bolls and allowing the moths to emerge naturally. An extremely heavy infestation developed in cotton planted on all dates. After the crop was harvested the stalks were cut and the crop debris collected by hand and burned. This clean-up was probably more thorough than is practicable under field conditions. Examinations in March of 1940 showed an average of 0.65 pink bollworm larva per square yard was present in the soil of the section planted on March 28, 1.05 larvae in the section planted April 20, and 4.60 larvae in the section planted May 5. Despite the larvae hibernating in the soil, no infestation developed in any of the blooms during the first 3 weeks of blooming in 1940, indicating that the fall clean-up was more effective as a control measure, or that the larvae hibernating in the soil were of less importance in maintaining the infestation than previously thought. Since it appeared that no survival had occurred, 75 pairs of pink bollworm moths were liberated in each section of the cage. Releases were made 21 days after the first blooms appeared on the cotton planted on each date, or on June 26, July 11, and July 25, in the respective sections. Records were made of the seasonal pink bollworm populations and after harvest the stalks were cut with machetes and burned as soon after picking was completed as would be practicable under field conditions, or on October 1 for the March 28 planting, October 27 for the April 20 planting, and December 3 for the May 15 planting. The bolls and crop debris that shattered to the ground were not collected by hand. Examinations of the surface trash and of the soil were made after the clean-up to determine the numbers of hibernating larvae remaining from each date of planting. The data on yields and overwintering populations are shown in the following table.

| Date planted | Yield of seed cotton per acre | Date of last picking | Overwintering pink bollworm population per square yard* | | |
|---|---|---|---|---|---|
| | | | In surface trash | In soil | Total |
| | Pounds | | | | |
| Mar. 28-- | 1,831 | Sept. 26 | 4.45 | 1.50 | 5.95 |
| Apr. 20-- | 1,773 | Oct. 26 | 31.23 | 5.67 | 36.90 |
| May 15-- | 1,783 | Nov. 20 | 36.69 | 8.19 | 44.80 |

* Surface trash collected December 4-6, soil samples December 10-11.

The results show that the later the cotton was planted and the later the stalks were cut and burned the higher the overwintering population. The different sections of the cage will again be planted on the same dates in 1941 to determine the infestations that develop naturally from the overwintering larvae remaining in the surface trash and soil.

Ground trash examinations for hibernating boll weevils.-- The examination of ground trash from woods near cottonfields for hibernating boll weevils that was started in 1935 seems to give more reliable data on weevil survival than the examinations of Spanish moss previously used. The surface trash consisting of leaves, twigs, and other forest debris with about 1 inch of the top soil is carefully collected from known areas and passed through specially designed shaker machinery to remove a large part of the coarse and fine material. The remainder, consisting mostly of particles approximating the size of boll weevils, is then examined by hand or placed in screen trays in a warm room so that the live weevils will become active and more easily collected. Many other insects are also present and a list of those found in the examinations in South Carolina during the winters of 1937-38 and 1938-39 was recently published in Circular E-528 by C. F. Rainwater.

During the fall of 1940, 104 samples of 2 square yards each examined at Tallulah, La., contained 31 live and 7 dead weevils (81.6 percent alive), or 721 weevils per acre. In March of 1941, 100 samples from the same locations yielded 30 live weevils, indicating that very little mortality had occurred during the winter of 1940-41. An additional 100 samples from near other fields were examined in the spring of 1941 and 46 live weevils and 18 dead weevils were found. The 200 samples examined in the spring of 1941 contained an average of 920 weevils per acre, which is a much larger number than has been found in previous spring examinations. The percentage alive was 80.9 percent, or practically the same as found last fall. Heavy rainfall occurred in November 1940 prior to collecting the ground trash and left the ground very unfavorable for taking the samples, but rainfall was below normal during the winter and the March samples were collected under more favorable conditions. The weevil population was heavy in all fields around Tallulah, La., in the fall of 1940 but a severe freeze on November 14 and 15 caught many weevils still in the fields. Many dead weevils were found in the fields but others probably dropped to the ground for protection and moved into the woods-trash shelter after the fall examinations were made.

Examinations were also made of 200 square yards of woods trash at Florence, S. C., this spring. A total of 81 live weevils, or an average of 1,960 per acre, were found. A comparison of the number of live weevils per acre found in the spring woods-trash examinations for the past 4 years at both localities is shown in the table below.

| Spring of-- | Live weevils per acre | |
|---|---|---|
| | Tallulah, La. | Florence, S.C. |
| 1938------- | 186 ± 96 | 1,476 |
| 1939------- | 226 ± 71 | 3,582 |
| 1940------- | 190 ± 69 | 176 |
| 1941------- | 920 ±130 | 1,960 |

Very little damage was caused to cotton in the vicinity of Florence last year following the severe winter of 1939-40, but the weevil population increased greatly late in the season and survived the winter in fairly large numbers as shown by the trash examinations.

Correction in survey of hemipterous insect damage to cotton in Arizona.--In the News Letter (Vol. VIII, No. 4, for Feb. 1941) the figures given in the table on page 21 for percentage of bolls punctured in short staple cotton in Arizona for 1940 represent the 7-year average for the counties. The correct figures for 1940 are 70.7 percent punctured bolls for Yuma County, 41.1 percent for Maricopa, 26.7 percent for Graham, 30.7 percent for Pinal, 10.3 percent for Santa Cruz, and 12.6 percent for Pima. The State average for 1940 of 33.4 percent punctured bolls, as given in the table, is correct.

## PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Wild-cotton eradication.--A number of years ago it was found that wild cotton, which was growing in great abundance in southern Florida, was heavily infested with the pink bollworm, from which this dangerous cotton insect was making its way northward to domestic cotton plantings. Consequently, a project was inaugurated designed to eradicate this pest through the destruction of this wild cotton plant upon which it depends for sustenance. Conditions for wild cotton eradication work throughout most of the present season have been unfavorable owing to an unusual amount of rain, resulting in bad roads and a very troublesome mosquito situation. However, there was less rainfall during March, and consequently, working conditions were greatly improved. Approximately 2,200 more acres were covered during March incident to the destruction of wild-cotton plants than during February, but approximately 48,000 less plants were found during March than during the previous month. In the Bradenton-Fort Myers subdistrict, the crews in Collier, Lee, and Charlotte Counties were working toward the completion of the second cleaning for the season, whereas the crews in Manatee, Hillsborough, and Pinellas Counties completed the second cleaning with perhaps the exception of a few locations reached by boat, and devoted considerable time to clearing the wild-cotton colonies of other vegetation to permit the penetration of air and sunlight and thus hasten germination of dormant wild cottonseed. In the Cape Sable area the second cleaning of the season was brought to a conclusion with the exception of one or two small areas, and, in addition, 700 acres was covered toward a third cleaning of the season. Approximately 3 plants per acre were found during this third cleaning. The houseboat crew attached to the Cape Sable area completed the cleaning of Dade County mainland colonies and then gave attention to the keys in Florida Bay. The second cleaning of Key Largo was completed during the month. This brought to a close a second cleaning of all the Main Keys group. Approximately 4 plants per acre were found on Key Largo during March. The houseboat crew attached to the Keys subdistrict completed the first cleaning of the season, together with a considerable amount of scouting work. This crew then began the second cleaning of the season by first giving attention to the Dade County mainland in the vicinity of Madeira Bay. In the Marathon-Key West section, Boca Grande Island was completed for the second time. During this second cleaning, 15,000 seedlings, but only 4 mature plants, were found. During March a total of 7,861 acres was covered, from which were removed 877 plants with mature bolls, 41,341 seedling plants, and 36 sprout plants.

Planting of the 1941 cotton crop in the lower Rio Grande Valley.--As a control measure for the suppression of the pink bollworm in the lower Rio Grande Valley of south Texas, State regulations were inaugurated for the 1941 cotton crop designed to retard cotton planting in that region so that the majority of overwintering pink bollworms would emerge in the spring prior to the fruiting of the crop. The date for planting was fixed between February 1 and March 15; however, excessive rainfall during both February and March resulted in only about 50 percent of the crop being planted at the end of March, and it was estimated that at least half of that must be replanted. Consequently, in order to enable Valley growers to complete the planting of the crop, the State Department of Agriculture extended the planting period to April 20.

Destruction of sprout and volunteer cotton.--Because of the mild climate and all-year growing season in the lower Rio Grande Valley of south Texas, the cotton plant affords continuous sustenance for the pink bollworm. Consequently, to successfully combat this destructive cotton insect in that region it is necessary to deprive it of material on which to propagate during the normal noncotton-growing period. The first phase of the program to accomplish this condition is the destruction of all cotton stalks as soon as the crop is picked out. However, portions of the roots are invariably left in the ground following plowing operations, which sprout throughout the year and furnish food for the build-up of infestation. Therefore, in order to maintain a host-free period, it is necessary to carry on an intensive campaign for the destruction of such plants from early fall until the fruiting of the subsequent crop. Field activities in connection with the removal of sprout plants were very limited during March owing to unfavorable weather conditions. Fields were too wet to enter during the greater part of the month, and the grubbing of sprouts was restricted to sandy, well-drained fields. However, abnormally cold nights retarded the sprout-cotton growth, and very little grubbing was necessary to maintain the host-free status.

## TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Reaction of smotherweed to curly-top virus.--The results from incomplete tests using the beet leafhopper (Eutettix tenellus (Bak.)) as a vector, being conducted at the Twin Falls, Idaho, laboratory, by H. C. Hallock, in cooperation with A. M. Murphy, of the Bureau of Plant Industry, indicate that smotherweed (Bassia hyssopifolia (Pall.) Kuntze) does not act as a reservoir of the curly-top virus, confirming the results previously obtained by H. H. P. Severin in California. The acreage occupied by this weed is increasing in waste areas and adjoining irrigated sections in southern Idaho and field studies have shown that under certain conditions it is a favorable summer breeding host of the beet leafhopper. In conducting these tests gravid leafhoppers that were viruliferous were confined on the smotherweed for a period of 7 days. One week later other leafhoppers known to be nonviruliferous were confined on these plants for a period of 4 weeks, after which they were transferred to sugar beet seedlings of a variety susceptible to curly-top and observations were made to determine whether the beets developed curly-top. Similar records were obtained by confining leafhopper nymphs on beet seedlings which had developed on the smotherweed plants from eggs deposited by the viruliferous adults which had previously been confined on the weed. In these tests, conducted under suitable conditions in the greenhouse, smotherweed was not susceptible to curly-top and the virus was not recovered from inoculated plants. This plant is grown readily under greenhouse conditions and will make an excellent host for rearing nonviruliferous beet leafhoppers.

Fumigation of tobacco at reduced pressures with hydrocyanic-acid gas.— In fumigation experiments recently completed by R. W. Brubaker and W. D. Reed, of the Richmond, Va., field laboratory, it has been shown that dosages of hydrocyanic-acid gas as low as 1 pound per 1,000 cubic feet produced a high mortality among the larvae of the cigarette beetle (Lasioderma serricorne (F.)) under conditions of reduced pressures and an exposure period of 3 hours. The average mortalities obtained among larvae placed at varying depths in bales of imported tobacco from exposure to dosages ranging from 1 to 4 pounds of hydrocyanic acid per 1,000 cubic feet of space were as follows: 4 pounds--100 percent mortality; 3 pounds--99.8 percent; 2 pounds--99.7 percent; 1 pound--97.2 percent. By means of test spikes 25 well-grown larvae of the cigarette beetle confined in perforated gelatin capsules were placed in each bale of tobacco at depths of 1¼, 3¼, 5¼, and 9½ inches.. The bales were placed in a small vacuum fumigation chamber and the pressure reduced to about 29 inches on a standard mercury gauge before introduction of the fumigant. After 3 hours' exposure the bales were removed from the chamber but the test insects were not removed from the bales until 72 hours following treatment, after which daily observations for 7 days were made to determine the percentage of larval mortality. In these tests there were 6 replicates of each treatment, each replicate embodying the fumigation of 2 bales of tobacco containing a total of 250 beetle larvae. The temperature of the tobacco was about 70°F. for all tests and the moisture content of the tobacco around 13 percent.

Antimony compounds other than tartar emetic effective against gladiolus thrips.--Additional tests conducted by G. V. Johnson, of the Beltsville, Md., field laboratory in 1940, have shown that calcium antimony tartrate (powder) and antimony lactate (liquid) show promising indications as substitutes for the tartar emetic in the spray formula recommended against the gladiolus thrips (Taeniothrips simplex Morison). The results of tests conducted on replicated field plots of gladiolus indicate that a spray mixture consisting of 2.2 pounds of calcium antimony tartrate and 4 pounds of brown sugar to 100 gallons of water was as effective against the gladiolus thrips as a spray mixture containing 2 pounds of tartar emetic and 4 pounds of brown sugar. However, when white sugar was substituted in the formula, the efficiency of the spray was reduced. Calcium antimony tartrate is slowly soluble in cold water and was unsatisfactory in this respect as compared to tartar emetic. In another test using only a single large plot of gladiolus 93.5 percent of the flowers produced were uninjured by thrips following treatment with a spray mixture consisting of 8 pounds of antimony lactate and 4 pounds of brown sugar to 100 gallons of water, while gladiolus, treated with an equivalent tartar emetic-brown sugar spray, produced 92.3 percent uninjured flowers.

## INSECTS AFFECTING MAN AND ANIMALS

Mosquito surveys at Camp Stewart, Ga. and Camp Davis, N.C.--At the request of the Office of C. C. C. Activities of the Forest Service, G. H. Bradley, of the New Smyrna Beach, Fla., laboratory, inspected the area for mosquito breeding in the vicinity of Camp Stewart, Ga. and Camp Davis, N.C., March 27-April 1 in company with Marion Lamb of the Forest Service. The surveys were made for the purpose of determining the need and preparing estimates and a working plan for a C. C. C. Camp near each Army Cantonment. The following species of mosquitoes were taken at the time of survey: Aedes vexans, Culex restuans, Anopheles crucians, and A. punctipennis.

Tests to determine distance of flight of stable flies.--Colored flies were released by W. E. Dove and S. W. Simmons, of the Panama City, Fla., laboratory, at six separate localities varying from 20 to 40 miles from coastal bays and paralleling the shoreline of northwest Florida for about 100 miles. Two marked flies were recovered on February 6 and 13, respectively, a distance of about 52 miles from the point of release. These individuals had been "colored" on January 3, or before, which was 33 and 40 days, respectively, prior to their recovery.

Synthetic resins as an adhesive base in combination with tickicides in the control of the Gulf coast tick.--E. B. Blakeslee, of the Panama City laboratory, reports that of 100 new mixtures tested, only 11 were capable of killing 90 percent of the ticks in 48 hours. Of these, 7 were in fair condition after 15 days exposure on the ears of animals, and 1 was in very good condition. Applications were without injury to the skin of the animals.

Office of Menard, Tex., laboratory burns.--Early on the evening of March 19 the office of the Menard, Tex., laboratory was completely destroyed by fire of an undetermined origin. The loss was complete and included valuable experimental data, several microscopes, and all office records and equipment.

Cube-sulphur dust as a control of cattle grubs.-- For the control of cattle grubs in small herds of cattle, E. W. Laake, R. W. Wells, and W. G. Bruce report that a mixture of equal parts of cube powder and wettable sulphur applied as a dust has given excellent results. They state that the treatment is simple, rapid, efficient, and inexpensive.

Cattle grub control demonstration.--E. W. Laake reports that in cooperation with the Extension Entomologist of the Texas A. & M. College and local county agents, demonstrations were given on cattle grub control by the personnel of the Dallas laboratory in Anderson and Cherokee Counties in eastern Texas. As a result of these demonstrations there followed a great deal of cattle grub control activity in Anderson County.

Wettable sulphur a desirable substitute for soap in cube-sulphur wash for cattle grubs.--It has been shown by R. W. Wells, E. W. Laake, and W. G. Bruce, of the Dallas, Tex., laboratory, that 6 ounces of wettable sulphur is a desirable substitute for the 2 ounces of soap per gallon of cube wash for cattle grubs, and that soft water is not essential when the sulphur is substituted. Results obtained with the sulphur-cube wash were better than those obtained with the soapy cube wash. The need for hot water to dissolve the soap is eliminated and the cost is not increased.

Breeding areas of Aedes vexans and A. lateralis.-- E. F. Knipling and C. M. Gjullin, of the Portland, Oreg., laboratory, report that preliminary soil sampling of the flood-water mosquito breeding areas showed a concentration of approximately 45 percent of the eggs around obstructions in one place and about 80 percent in another. The area covered by obstructions in each case represented about 5 percent of the total area sampled. The obstructions cited were fallen logs, dense brushy areas, and stumps.

## FOREIGN PLANT QUARANTINES

Another smuggler thwarted.--On February 12, A. H. Malcolm, of the customs service at Miami, Fla., who has a reputation for detecting would-be smugglers, got two small mango plants from the sleeves of a lady's sweater when the owner returned from Cuba. The plants were infested with Chrysomphalus dictyospermi (Morg.), Howardia biclavis (Comst.), and Leucaspis indica Marl.

Entomological interceptions of interest.--Three living adults of the bruchid Bruchus sp., probably guttalis Rey., were intercepted at New York on November 22, 1940, in vetch seeds in cargo from Portugal. A living adult of the curculionid Coleocerus marmoratus Horn was found at Brownsville, Tex., on March 7, 1941, with lettuce in baggage from Mexico. A living larva of the pink bollworm (Pectinophora gossypiella (Saund.)) was taken at New Orleans on February 13, 1941, in cottonseed in mail from Brazil. Nine living larvae of the Asiatic rice borer (Chilo simplex Btl.) were intercepted at Corpus Christi, Tex., on March 14, 1941, in rice straw in cargo from Japan. A living adult of the pentatomid Mormidea collaris Dall. was found at Laredo, Tex., on March 17, 1941, with an orchid plant in baggage from Mexico. Living specimens of the bruchid Bruchus ramicornis Er. were intercepted at the Inspection House at Washington, D. C., on March 17, 1941, in Vigna sinensis seeds in express from Brazil. Four living larvae of the trypetid Anastrepha nonbinpraeoptans Sein were taken at Newport News, Va., on February 5, 1941, in mango in stores from Haiti. Living specimens of the bostrichid *Dinoderus brevis* (Horn) were intercepted at New Orleans on February 21, 1941, in bamboo strips used as dunnage from India. A living adult of the coreid *Leptoglossus chilensis* (Spinola) was taken at New York on March 18, 1941, with excelsior packing for grapes in cargo from Chile. Specimens of the coccid *Aonidiella eugeniae* (Hempel) and the whitefly *Aleuroplatus* sp., apparently an undescribed species closest to *graphicus* Bondar, were intercepted at the Inspection House, Washington, D. C., on January 17, 1940, on leaves of *Eugenia cauliflora* in freight from Brazil. A living adult of the nabid *Nabis punctipennis* Blanch. was taken at Norfolk, Va., on February 21, 1941, with cabbage in stores from Chile. Specimens of the coccid *Aspidiotus degeneratus* Leon. were intercepted at Seattle, Wash., on January 9, 1941, on camellia leaves in cargo from Japan. Living workers and nymphs of the termite *Coptotermes* sp. were found at Portland, Oreg., on January 25, 1941, in taro in cargo from China. T. E. Snyder states that this termite is very destructive and is not found in the United States. A living adult of the cucujid *Laemotmetus rhizophagoides* (Walk.) was intercepted at Norfolk, Va., on March 21, 1941, in bamboo dunnage from the Dutch East Indies. Living specimens of the Argentine ant (*Iridomyrmex humilis* Mayr.) were collected in the field in Hawaii on January 6, 1941, on hibiscus blooms. M. R. Smith, who made this determination, states that this is the first record of the Argentine ant becoming established in Hawaii.

*Pathological interceptions of interest.*--*Aphelenchoides* sp., near *A. limberi* Steiner, *Aphelenchus avenae* Bastian, *Hexatylus* sp. near *H. latus* Thorne, and *Paraphelenchus pseudoparientinus* Mic. were found January 1 at New York in leaves and stems of dried sage (*Salvia officinalis*) in a shipment of 40 bags from Spain. *Bacterium citri* (Hasse) Doidge was found on oranges from China January 21 at San Pedro and on sour limes from Java March 28 at Boston. *Claviceps paspali* (Schw.) Stevens and Hall was found at New York March 12 in paspalum seed from Canal Zone. *Colletotrichum orchidearum* All. was intercepted at San Francisco January 17 on *Phalaenopsis grandiflora* from the Philippines. *Coniothyrium* sp. with spores larger than in species described on orchids was found at San Francisco January 15 on *Epidendrum aurantiacum* from Guatemala. *Helicoma olivaceum* (Karsten) Linder, an interesting and unusual saprophyte, was found on *Paeonia moutan* from Japan December 4, 1940, at Hoboken. The fungus causing a leaf spot on camellia leaves from Mexico intercepted at Hoboken August 12, 1940, has been determined as *Hendersonia camelliae* Pass., although the spores are rather long. *Linospora* sp., as well as other fungi, was found on an avocado from Mexico intercepted February 2 at Brownsville. *Phyllosticta* sp. unlike species reported on orchids was intercepted January 15 at Hoboken on a *Cattleya* (?) sp. leaf from Brazil. *Phytophthora* sp. was found on an eggplant fruit from Cuba March 19 at New York. *Rhabdospora* sp. and *Robillarda* sp., no species of either genus reported on peony, were found on *Paeonia moutan* from Japan December 27, 1940, at San Francisco. *Sporonema phacidioides* Desm. was found on alfalfa leaves in mail from Mexico January 28 at Hoboken. *Thielaviopsis paradoxa* (DeSeyn) v. Hoehn. was found on *Pandanus* sp. seed from Colombia March 20 at New York. *Ustilago nuda* (Jens.) Kell. & Sw. was found on barley from Mexico March 1 at El Paso. Spotted wilt virus was found on a tomato in cargo shipment from Cuba March 24 at Baltimore.

## DOMESTIC PLANT QUARANTINES

Mormon crickets hatch early and control operations begin.--Mormon crickets began hatching in the Oregon counties of Wasco and Jefferson early in February and by March 15 it was estimated that 250,000 acres, most of which is on the Warm Springs Indian Reservation, was infested with first to third instars. Control operations were begun in March with baiting and dusting materials provided by the Bureau and applied by the Agency. By March 15, field observers found the hatch was approximately 85 percent complete in the above counties and in progress in two other counties in Oregon, two in Washington, and three in Nevada. Last year the first hatch was reported on March 8 as compared with February 8 this year. In Washington, cricket hatching was first observed this year in Franklin County on March 3. By March 29 hatching was 90 percent complete in that county and well advanced in Klickitat County. In Utah, on March 12, hatching was observed in Tooele County and first instars were found the same week in Juab and Utah Counties. In Nevada, a 25-percent cricket hatch was reported in the Copper Canyon area of Lander County on March 14, and on the same date nymphs were seen in Pershing and Humboldt Counties. By the close of the week of March 22, a 50-percent hatch had occurred near Wells, Elko County. Control materials have been moved into the infested areas and active control operations were expected to begin April 1. In Idaho, crickets were hatching on the south-facing slopes in Washington County by March 20.

Grasshopper development.--Examination of egg pods in the South Dakota counties of Spink, Beadle, and Tripp at the close of March showed that egg development ranged from the coagulation stage to the early segmentation stage. In western Kansas counties, examinations indicated that the eggs had overwintered in good condition and some had reached the eye-spot stage.

Plans for grasshopper control.--Grasshopper bait materials were transferred during March from areas where there are surplus materials, or where control is not contemplated, into areas having a deficiency of materials. Supervisors in key positions were returned to duty status and began to organize the work for the 1941 control season. The operations on grasshopper and Mormon cricket control this year are provided for under memoranda of understanding entered into between the Bureau and the States, wherein the responsibilities of each are agreed to. Meetings have been held with officials of the various States and memoranda of understanding completed with 22 infested States.

Bureau assists in cutworm control.--Because of reports of serious outbreaks of cutworms in Kansas, Colorado, Nebraska, and Utah, Federal assistance has been authorized in counties where outbreaks are such as to warrant assistance and where control is beyond the means of local communities. The release of grasshopper bait materials to farmers for combating the cutworms has been authorized. The outbreak in Kansas is reported by plant pest-control officials to cover 30 or 40 counties in the western part of the State. The Colorado and Nebraska infestations are contiguous to the outbreak in northwestern Kansas. In Utah heavy infestations are reported in two centrally located counties. State leaders in the grasshopper control program in these States are investigating this outbreak to determine if the species of cutworms in these areas can be combated with grasshopper bait.

White-fringed beetle control program.--At a conference held at Gulfport, Miss., on March 12 by the Federal and State agencies concerned with the white-fringed beetle control program, the results of the survey and control activities since the initiation of the project were given full discussion and consideration, and a program of work for 1941 was submitted to the cooperating agencies and approved. It is proposed under this program to determine more accurately the effect of suppressive measures on selected areas of infestation by applying one or a combination of such practices throughout the entire period of beetle emergence. On other areas from which there exists appreciable danger of artificial or natural spread of infestation, suppressive measures will be conducted only during the period of peak emergence or for such additional time as is necessary to reduce risk of spread to a minimum. Such a modified program will, it is believed, effectively control artificial as well as natural spread of the pest; will provide commercial control to infested agricultural areas; and will give further opportunity to determine the effectiveness of suppressive measures on isolated areas of infestation, which will be conducted throughout the entire period of beetle emergence.

Treatment methods for white-fringed beetle further modified.--The requirements for treating nursery stock and potting soil for shipment from the white-fringed beetle area have been modified by recent revisions of circulars B. E. P. Q. 486, 489, and 503. The releases on methyl bromide make available treatments for movement of stock which previously has been restricted to shipment within the regulated areas.

Legume weevil resurvey.--A resurvey for the legume weevil, *Hypera brunneipennis* Boh., was completed early in April. The survey was confined principally to areas in Arizona which were found infested last year, to determine the spread and the present status of the infestation. A few spot surveys were also made in several areas in California where infestations were not found last year but where it was thought that the weevils might have since become established. No new areas of infestation were found. However, considerable spread was noted in the Yuma area, and considerable increase in the intensity of the infestation attributed principally to climatic conditions which were apparently particularly favorable to the development of the weevil this year. At the University of Arizona Experimental Date Garden at Tempe, Ariz., where infestations of the weevil were located last year, eradication measures were conducted in cooperation with the State. Despite some delay caused by unseasonable weather it is felt that the measures were applied in sufficient time to forestall an increase in the infestation and it is hoped that eradication may have been accomplished. A number of methods were tried including the use of herbicides, flame-throwers, mowers, and the disking of the soil. Due to the wet condition of the soil following heavy rains, it was found necessary to use a combination of these methods. A survey of the agricultural areas in Mexico adjacent to the Yuma infestation was made in cooperation with inspectors of the Mexican Government. No infestation was found.

Sweetpotato weevil control conference at Gulfport.--The sweetpotato weevil has apparently been eradicated from 13 counties in Alabama, Mississippi, Georgia, and Texas since the cooperative project was begun in 1937, according to a statement by the project leader, T. R. Stephens, at a conference of Federal and State officials and others held at Gulfport, Miss., on March 13. Initial and systematic surveys have been conducted, he stated, in 184 counties of 6 States. B. M. Gaddis outlined the primary objectives of the project and gave a resume of the various operations of the several States. Avery S. Hoyt, J. C. Holton, and J. H. Lloyd attended this conference, as well as the one relating to the white-fringed beetle work, and participated in the discussion.

1941 work programs proposed. Expansion in Mississippi.--Following the above conference, programs for sweetpotato weevil control work in each State were developed and it was agreed that the activities in each State would be carried on along the same general plan as heretofore, except in Mississippi. In that State it seems probable that eradication is being approached in the commercial-producing areas, and it was considered advisable to extend the eradication measures to the Gulf coast counties.

Peach mosaic work programs for 1941.--Work programs for peach mosaic operations this year in the various infected States are being prepared in conferences with the respective pest-control officials. In the mosaic-infected States where grower cooperation has been satisfactory, it is planned to make careful and complete inspections of nurseries, budwood sources, and their environs; to inspect previously infected and adjacent properties; and to make every effort to remove diseased trees as discovered.

Nursery inspection for peach mosaic under way in Texas.--Early in April Federal-State inspection of the extensive peach nurseries in Texas was begun with a view to completing the work by May 15 as provided in the uniform quarantines pertaining to the peach mosaic. The large number of nurseries involved requires that the work be undertaken early in the season and that as many Federal and State inspectors as possible be assigned to that phase of the activity. Prior to beginning nursery work, inspectors were congregated for a preliminary "brush up" on peach mosaic symptoms in relatively concentrated commercial peach orchards in San Saba County. Several hundred mosaic infected trees were found during the first few days, giving our personnel an opportunity to review their contact with this disease before beginning the nursery inspection. This phase of peach mosaic inspection and the control is conducted under a work program and memorandum of agreement between the cooperating Federal and State agencies in which the undertakings and responsibilities of each party are clearly defined, and which provide for intimate understanding and cooperation of the Federal and State Departments of Agriculture. In other States, the nursery inspection work is of less volume and will be undertaken as the season advances, followed with delimiting surveys and diseased-tree removal.

Blossom inspection in California for peach mosaic.--The blossom inspection of trees of the large-flowered variety for peach mosaic disease was begun late in March in infected areas in California. In the Yucaipa district a high percentage of trees was found infected in some orchards while in other areas only scattered trees were found diseased. Peach mosaic disease research workers have approved this method of inspection in large-flowered varieties, in which symptom expression in leaves is not pronounced.

Minnesota establishes terminal inspection.--The State of Minnesota has established terminal inspection with facilities at St. Paul for the inspection of the following plants: All wild and cultivated trees, shrubs, and woody vines; perennial roots, such as peonies and iris; small-fruit plants, such as strawberries and raspberries; herbaceous perennials, such as hollyhocks and other hardy flowering plants; cuttings, buds, grafts, and scions for or capable of propagation. Provision has also been made under the terminal inspection procedure for the enforcement of the Minnesota quarantines relating to the alfalfa weevil and certain diseases of raspberry plants. The postal regulation giving notice of this action is dated March 7, 1941.

Airplanes being purchased.--Bids have been accepted for the purchase of two airplanes to replace the two White Standard biplanes that were burned in the Monroeville, Ala., fire last year. Bait heppers are now being installed in the new planes and it is expected that they will be ready in April for use on Mormon cricket control activities in Nevada, and later, on white-fringed beetle and grasshopper control in the event the need develops for use of such planes in distributing either bait or dust by this means.

Mr. Sheals heard at Central Plant Board meeting.--R. A. Sheals attended the joint meeting of the Central Plant Board on March 26 at Columbia, Mo., and presented a paper on the activities of the white-fringed beetle project.

Mr. Roberts assigned to Washington.--R. A. Roberts, Assistant Project Leader on Mormon cricket control, was temporarily assigned to the Washington office of the Division of Domestic Plant Quarantines beginning April 1.

Interesting interceptions.--A miniature hotframe containing 10 pounds of soil from the Japanese beetle area was reported in March by a New York inspector. This is the second interception of its kind in New York, each from a different source. Corn borer larvae in a shipment consigned from a point in China to a pet shop at a point in Missouri were recently found by the transit inspector at St. Louis on his regular tour of duty. The shipment was called to the attention of the port inspector at Chicago. An express shipment of uncertified cottonseed from the pink bollworm area, which was intercepted at Dallas in March, is believed to be the first shipment of cottonseed in quantity moving in violation of Quarantine No. 52, that has been found by a transit inspector.

## CONTROL INVESTIGATIONS

Fumigation schedules for nursery stock for Japanese beetle larvae.--In cooperation with the Japanese Beetle Control Division and the Division of Fruit Insect Investigations, H. C. Donohoe, of the White Horse, N. J., laboratory, has completed experimental work on two more fumigation schedules for nursery stock for Japanese beetle larvae. This makes a total of seven treatments with methyl bromide at temperatures varying from 50° to 70° F. now available. In six of these treatments, ranging from 50° to 63°, inclusive, the dosage of 2½ pounds of methyl bromide is maintained constant, and the time and temperature varied from 2½ to 4½ hours in half-hourly increments. At 70°, a dosage of 2 pounds is used. Work is under way at the White Horse laboratory on treatments at lower temperatures and with varying dosages.

*The application of methyl bromide in the greenhouse and the effect of relative humidity on efficiency.*--Further studies by H. H. Richardson and A. H. Casanges, of the Beltsville, Md., laboratory, have again shown that the fast spray and slow pan methods of vaporization of methyl bromide are of about equal efficiency in greenhouse fumigations under wet conditions. Vaporization by spraying required 1 to 3 minutes while pan vaporization was adjusted to 90 to 110 minutes. Under fairly dry conditions, the results slightly favored the fast spray method. From a practical standpoint, the spray method seems preferable. For vault fumigation previous work indicated a fast type of vaporization to be more effective than a slow vaporization in 6-hour exposures. High and low relative humidity were again shown to have little effect on efficiency against the common red spider or Mexican mealybug, but higher efficiency was obtained at high humidity against the confused flour beetle.

## IDENTIFICATION AND CLASSIFICATION OF INSECTS

*The Argentine ant in Hawaii.*--In January of this year a number of specimens of the Argentine ant, *Iridomyrmex humilis* Mayr, were collected at Honolulu, Hawaii, by W. C. Goolsby and J. D. Gomez in the soil of a vegetable garden from an infestation reported as heavy. G. F. Callaghan collected a second series on *Hibiscus* blossoms. This is the first time that the species has been recorded from Hawaii. It is likely that the climate of the Islands is such that the ant will establish itself and become a serious pest. Although specimens have been taken several times from airships plying between the United States and the Pacific Islands, the species is not known to occur on any of the latter.

*A species of Tetrastichus parasitic on thrips.*--B. D. Burks, of the Illinois Natural History Survey, temporarily engaged by the Bureau of Entomology and Plant Quarantine to revise the Nearctic species of the chalcidoid genus *Tetrastichus*, has concluded that *Tetrastichus tatei* Dozier (Jour. Agr. Univ. Puerto Rico, 21, 1937, p. 129) described from Puerto Rico as a parasite of *Gynaikothrips uzeli* Zimm., is identical with *Tetrastichus thripophonus* Waterston (Bul. Ent. Res. 13, 1923, p. 453) recorded from *Liothrips urichi* Karny on *Clidemia* in Trinidad, British West Indies. The record by Mason (Ent. News 33, 1922, p. 199) of *Tetrastichus* n. sp. from *Cryptothrips laureli* Mason in Florida is also referable to *T. thripophonus*. It seems probable that the species is quite widely distributed. *Tetrastichus thripophonus* was introduced into Fiji with *Liothrips urichi* when the latter was introduced there in an attempt to control *Clidemia*.

*An earwig new to the United States found in New Jersey.*--Three specimens of the earwig *Marava wallacei* (Dohrn) were recently submitted for identification. The material is said to have been collected in a wholesale bakery at Dumont, N. J. Dumont is located in extreme northeastern New Jersey, near the Hudson River, north of New York City. The finding of this earwig is of interest because it is a widely distributed species of the Australian Region, frequently intercepted in quarantine but not known to be established in the United States. It inhabits New Guinea and various other islands, as well as the mainland of Australia, and when intercepted is usually associated with logs. Interception has often occurred at Middle Atlantic ports, and this fact suggests that the specimens taken at Dumont may have been introduced in this way. *Marava wallacei* belongs to the family Labiidae and resembles *Prolabia arachidis* (Yersin), differing from the latter especially in that the coloration is much darker and in that *wallacei* frequently is long-winged, with conspicuous orange spots near the ends of the wings.

*Food plant records for two hemipterous insects*.--Food plant records for two hemipterous insects from Hawaii may prove of interest as they are apparently new records, or at least have not received special notice as potential economic pests. The specimens (four of each species) were submitted to the Bureau of Entomology and Plant Quarantine and determined by H. G. Barber as *Orius persequens* (White), an anthocorid taken on green corn at Waimea, Oahu, T. H., on February 25, 1931, and *Teleonemia scrupulosa* Stal (= *T. lantanae* Dist.), collected on potato leaves at Waipahu, Oahu, February 15, 1941.

*A new aleyrodid record for the United States*.--L. L. English, of the Agricultural Experiment Station, Alabama Polytechnic Institute, submitted for identification several specimens of an aleyrodid collected on *Azalea indica* at Spring Hill, Ala. The species has been identified by Louise M. Russell as *Pealius rhododendri* Takahashi, described in 1935 on *Rhododendron* sp. from Osaka, Japan. Apparently this is the first record of its occurrence in North America. *Pealius rhododendri* is found only occasionally, and up to the present at least has not developed dense, injurious populations as is true in the case of *Aleyrodes azaleae* B. & M.

*Food habits of some Neotropical Japygidae*.--To most entomologists the food habits of the apterygotan insects of the family Japygidae are completely unknown. In fact it has been established only recently that these insects are predaceous. They use the powerful pincers on the end of the abdomen to hold the prey while parts of the same, or possibly the complete body, are broken up with the mandibles and maxillae and swallowed after but little mastication. Inside the alimentary canals of five japygids from the Neotropical Region the following arthropods, or their parts, were found: The head of an adult fungus gnat, Mycetophilidae, determined by A. Stone; partial remains of a beetle larva of the family Staphylinidae and part of the body of a beetle larva, probably of the family Carabidae, both determined by W. H. Anderson; the thorax of an adult beetle; some of the legs and other parts of a beetle mite, superfamily Oribatoidea, and partial remains of a predaceous mite of the family Parasitidae; the last tarsal segment of an insect leg bearing two equal claws and a pulvillus together with other miscellaneous parts. Further studies of the food habits of the japygids are planned.

*Xylaplothrips subterraneus Cwfd. in Oregon*.--Specimens taken at Toronto, Canada, on lily bulbs from Oregon, sent in by J. McDunnough, included two specimens of *Xylaplothrips subterraneus* Cwfd. The latter was originally described from England on lily bulbs. This is the first record of this species in North America.

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